

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1 1.-10. (Cancelled)

1 11. (Currently Amended) A method for adapting a Bayesian network, comprising:  
2 generating a set of parameters for the Bayesian network in response to a set of past  
3 observation data such that the Bayesian network models an environment having at least hardware  
4 elements;  
5 obtaining a set of present observation data from the environment;  
6 determining an estimate of the parameters in response to the present observation data;  
7 adapting a learning rate for the parameters such that the learning rate responds to changes  
8 in the environment indicated in the present observation data by increasing the learning rate when  
9 an error between the estimate and a mean ~~value~~ of the parameters is relatively large and  
10 decreasing the learning rate when ~~convergence~~ convergence is reached between the estimate  
11 and the mean ~~value~~ of the parameters;  
12 updating the parameters in response to the present observation data using the learning  
13 rate; and  
14 using the Bayesian network to model the environment and diagnose problems or predict  
15 events in the environment.

1 12. (Currently Amended) The method of claim 11, wherein adapting the learning rate  
2 comprises adapting a different learning rate for each parameter of the Bayesian network.

1 13.-14. (Cancelled)

1 15. (Currently Amended) The method of claim 11, wherein a subset of values in the present  
2 observation data is unavailable when updating the parameters.

1 16. (Previously Presented) The method of claim 11, wherein the environment is an online  
2 environment.

1 17. (Previously Presented) The method of claim 16, wherein the online environment is an  
2 email system.

1 18. (Previously Presented) The method of claim 16, wherein the online environment is an  
2 e-commerce system.

1 19. (Previously Presented) The method of claim 16, wherein the online environment is a  
2 database system.

1 20. (Currently Amended) The method of claim 11, wherein updating the parameters  
2 comprises determining an initial set of the parameters and then updating the parameters in  
3 response to the present observation data using the learning rate.

1 21. (Currently Amended) A ~~hardware~~ system, comprising:  
2 an environment having at least hardware elements to generate ~~that generates~~ a set of  
3 present observation data;  
4 a Bayesian network to perform ~~that performs~~ automated reasoning for the environment in  
5 response to the present observation data;  
6 an adapter to obtain ~~that obtains~~ the present observation data from the environment and to  
7 determine ~~that determines~~ an estimate of a set of parameters for the Bayesian network in response  
8 to the present observation data, the adapter to adapt ~~by adapting~~ a learning rate for the  
9 parameters to respond to changes in the environment by increasing the learning rate when an  
10 error between the estimate and a mean ~~value~~ of the parameters is relatively large and decreasing  
11 the learning rate when ~~converges~~ convergence is reached between the estimate and the mean  
12 ~~value~~ of the parameters, wherein the Bayesian network is configured to model ~~models~~ the  
13 environment and ~~diagnoses~~ diagnose problems or ~~predicts~~ predict events in the environment.

- 1 22. (Currently Amended) The ~~hardware~~ system of claim 21, wherein the adapter is  
2 configured to use ~~uses~~ a different learning rate for each parameter of the Bayesian network.
- 1 23. (Currently Amended) The ~~hardware~~ system of claim 21, wherein the adapter is  
2 configured to determine ~~determines~~ the parameters by determining an initial set of the  
3 parameters and then to update ~~updating~~ the parameters in response to the present observation data  
4 using the learning rate.
- 1 24.-25. (Cancelled)
- 1 26. (Previously Presented) The hardware system of claim 21, wherein a subset of values in  
2 the present observation data is unavailable.
- 1 27. (Previously Presented) The hardware system of claim 21, wherein the environment is an  
2 email system.
- 1 28. (Previously Presented) The hardware system of claim 21, wherein the environment is an  
2 e-commerce system.
- 1 29. (Previously Presented) The hardware system of claim 21, wherein the environment is a  
2 database system.
- 1 30. (New) The method of claim 11, wherein the mean of the parameters comprises a mean  
2 value for each of the parameters.
- 1 31. (New) The method of claim 12, wherein the estimate comprises an estimated value for a  
2 particular one of the parameters, and the mean comprises a mean value for the particular  
3 parameter, and wherein adapting the learning rate is based on the estimated value and mean  
4 value for the particular parameter.

1 30. (New) The method of claim 11, wherein the mean is a running average of values of at  
2 least one of the parameters.

1 31. (New) The method of claim 11, wherein the learning rate is increased in response to the  
2 error between the estimate and the mean being greater than a particular value, and the learning  
3 rate is decreased in response to the error between the estimate and the mean being less than a  
4 threshold.

1 32. (New) The system of claim 21, wherein the mean of the parameters comprises a mean  
2 value for each of the parameters.

1 33. (New) The system of claim 22, wherein the estimate comprises an estimated value for a  
2 particular one of the parameters, and the mean comprises a mean value for the particular  
3 parameter, and wherein adapting the learning rate is based on the estimated value and mean  
4 value for the particular parameter.

1 34. (New) The system of claim 21, wherein the mean is a running average of values of at  
2 least one of the parameters.

1 35. (New) The system of claim 21, wherein the learning rate is increased in response to the  
2 error between the estimate and the mean being greater than a particular value, and the learning  
3 rate is decreased in response to the error between the estimate and the mean being less than a  
4 threshold.